DCLU Director's Rule 5-2002

Applicant:	Page	Supersedes:
City of Seattle Department of Design, Construction and Land Use	1 of 4	N/A
	Publication: 6/13/02	**Effective:** 11/26/02
Subject: Exceptions to Installing Fire and Smoke Dampers in Exhaust Only Shafts in other than Highrise Buildings – Prescriptive Path	**Code and Section Reference:** 1997 SBC Sections 713.10, 713.11, Chapter 9	
	Type of Rule: Code Interpretation	
	Ordinance Authority: SMC 3.06.040	
Index: Building Code/Technical & Procedural Requirements	**Approved** (signature on file) 11/23/02 **Diane M. Sugimura, Acting Director**	**Date**

PURPOSE:

The purpose of this Director's Rule is to set forth prescriptive conditions under which the exceptions to installing smoke dampers and fire dampers may be used concurrently in the same exhaust-only shaft enclosure penetration, i.e., the same subduct, for certain occupancy types. This Director's Rule applies only to buildings that do not fall within the definition of highrises per Seattle Building Code (SBC) Section 403. Buildings defined as highrises per SBC Section 403 must use Director's Rule 9-01 in order to omit fire and smoke dampers per Exceptions 3 to both SBC Sections 713.10 and 713.11.

BACKGROUND:

Seattle Building Code (SBC) Sections 713.10 and 713.11 require smoke and fire dampers, respectively, at penetrations of exhaust-only shaft enclosures. Smoke dampers may be omitted by an exception to Section 713.10, item 3, where there are exhaust-only openings in a vented shaft served by a continuously operating fan and protected using the provisions of SBC Chapter 9. Fire dampers may be omitted by an

exception to Section 713.11, item 3, where the shaft is penetrated by a steel exhaust air subduct extending vertically upward at least 22 inches (559 mm) above the top of the opening in a vented shaft where the airflow is upward.

RULE:

Seattle Building Code Section 713.11, exception number 3, which allows omission of fire dampers in an exhaust-only shaft enclosure penetration, may be used concurrently with SBC 713.10, exception number 3, which allows omission of a smoke damper, in buildings not subject to the smoke control provisions of SBC Section 403 under the following conditions. Plans shall be sufficiently detailed to show compliance with the prescriptive requirements set forth below.

1. **Occupancy and Exhaust Type Restrictions.** This rule applies to B, M, and R occupancies, and is limited to the following types of exhaust systems: domestic kitchen exhausts including range hoods, residential or commercial bathroom exhausts, clothes dryer exhausts, laundry room general exhausts, electrical closet exhausts, janitor closet exhausts, and other general environmental air exhaust systems.

2. **Shaft and Subduct Construction Requirements.**

   a) Shaft. The shaft shall be of at least 1 hour construction terminating at the roof and a minimum of 10 feet from a property line, operable opening, or mechanical air intake. The exhaust shaft walls may not be used as one or more sides of the subduct, unless covered by sheet steel.

   b) Subduct. The subduct shall be constructed of steel at least 0.019 inch (0.48 mm) thickness (No. 26 galvanized sheet steel gage), and extend at least 22 inches (559 mm) above the top of the shaft enclosure penetration. No more than 12 subducts are allowed in any one exhaust shaft using this rule.

   The exhaust shaft and subducts shall be of substantially airtight construction (joints and seams continuously sealed).

3. **Fan Location and Airflow.** The exhaust shaft fan shall be located on the roof. Section 713.11, exception 3 requires airflow to be upward in order to use the exception.

4. **Applicable 1997 Seattle Building Code Chapter 9 Provisions.** Seattle Building Code Section 713.10, item 3 allows omission of smoke dampers in shaft enclosure penetrations protected using the provisions of SBC Chapter 9. Following is a list and description of required Chapter 9 provisions that, at a minimum, must be specified on the plans. For complete text and requirements, refer to Chapter 9 of the 1997 Seattle Building Code.

   a) Section 905.7.2. Requires components of exhaust shaft fans to be rated by the manufacturer to withstand temperatures reaching 250°F, at a minimum.

b) Section 905.7.3. Requires duct materials and joints to be capable of withstanding the probable temperatures and pressures to which they are likely to be exposed during a fire.

c) Section 905.7.4. Requires exhaust outlets be located so as to minimize the reintroduction of smoke into the building, and to limit exposure to the building and adjacent buildings. At a minimum, compliance with Seattle Mechanical Code Section 505.9, item 2 is required (exhaust outlet location limitations).

d) Section 905.7.6. Requires belt drive exhaust shaft fans to have 1.5 times the number of belts required for design duty with the minimum number of belts being 2. Also requires motors driving exhaust shaft fans to have a service factor of 1.15.

e) Section 905.8. The exhaust shaft fan serving an exhaust system constructed according to this rule shall be supplied with two sources of power. Primary power shall be the normal building power systems. Secondary power shall be from an approved source complying with the Seattle Electrical Code (e.g. "tap ahead of the main"). Plans shall describe compliance with this section.

f) Section 905.13.3. Provides that only the firefighter's controls at the fire alarm panel shall control the exhaust shaft fan's operation on or off during an alarm event. Plans shall describe compliance with this section.

5. **Exhaust Shaft Fan minimum CFM Requirements.** The exhaust shaft fan's operation shall be continuous. At a minimum, the exhaust shaft fan shall have two speeds: low-speed continuous operation, which shall have a capacity of at least 1000 cubic feet per minute (CFM), and high-speed operation, which shall have a capacity at least 1.5 times the low speed. The building official may allow the low-speed continuous operation capacity to be reduced if supported by calculations.

6. **Exhaust Shaft Fan High-Speed Operation and Control Requirements.** The exhaust shaft fan's high-speed operational mode shall be activated upon receipt of a signal from the following detection devices or systems:

   a) Group B or M Occupancies: duct smoke detectors located within ducts at each exhaust shaft penetration, and the following:

      i. water flow signal from sprinkler system, if such system is provided throughout the building; and

      ii. fire alarm signal from fire alarm system, if such system is provided throughout the building.

   NOTE: In addition to activating the exhaust shaft fan's high speed operational mode, duct smoke detectors shall initiate a supervisory signal at the fire alarm panel, not an alarm signal.

   b) Group R Occupancies: fire alarm signal from fire alarm system, if such system is provided throughout the building.

   In addition to automatic activation of the exhaust shaft fan high speed operation, manual controls shall also be provided for firefighters use. A 3-way switch

(on/off/auto), or equivalent controls through the fire alarm panel, shall be provided for each fan just inside the buildings main entrance in a location approved by the fire department. The switch shall be located next to the fire alarm annunciator for buildings equipped with fire alarm systems.